Chapter 2. Alternatives, including the Proposed Action

2.1 Introduction

This chapter describes and compares the alternatives considered in the Como Forest Health Project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form to sharply define the differences between each alternative and provide a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., road construction versus no road construction) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the amount of erosion caused by cable versus ground-based yarding). The estimates provided in this section were derived in the same way for each alternative and are used to compare alternatives. The actual quantities may vary after project implementation because of unforeseen factors arising during implementation.

2.2 Alternatives Considered in Detail

The Forest Service developed 4 alternatives to carry through analysis, including the No Action and Proposed Action alternatives, in response to issues raised by the public. Other alternatives were considered but not analyzed in detail. Alternatives not analyzed in detail are discussed in section 2.3.

2.2.1 Alternative 1 – No Action

Under the No Action alternative, current management plans would continue to guide management of the project area (Figure 2.2- 1). No timber harvest, thinning, road construction or reconstruction, or prescribed fire would be implemented to accomplish the Como Forest Health project goals.

Implementation of activities approved in earlier decisions would continue (Table 2.2- 1).

Table 2.2- 1: Activities Occurring in the Como Forest Health Project Area

PROJECT NAME	TYPE OF PROJECT
Trapper Peak allotment	Range management
Recreation management	Lake Como campground and recreation area, dispersed sites, Trail 502
Elytroderma deformans study	Research on management of elytroderma needle cast
Lost Moose Hazardous Fuels Reduction project	Prescribed fire in areas north of Lost Horse Road
Lake Como East DM	Prescribed understory burn overlaps Unit 14 and the lower Lake Como recreation area.
Forest-wide TSI Project 2013	Non-commercial thinning across the Bitterroot National Forest

2.2.2 Alternative 2 – Proposed Action

Alternative 2, the proposed action, was modified between scoping and the DEIS after additional fieldwork indicated some of the originally proposed actions were not feasible, treatments were unnecessary at this time, or there were better locations for the proposed activities. Other changes

were made to simplify the analysis. Units that were largely in the riparian habitat conservation areas (RHCAs) (Units 2, 29, 30, 31, 33, 35, part 63 (below the ditch road)) do not require treatment at this time to meet or sustain the riparian management objectives. Treatments in the RHCA need to emphasize the riparian dependent resources (INFISH 1995, Standard and Guide TM-1(b) and Attachment A page A-4). Unit 40 was withdrawn from the analysis because it was a small skyline unit and no other skyline units were close enough to make moving the equipment to the unit feasible. Some units were combined because the forest composition and proposed treatments were similar (Figure 2.2- 2).

- Unit 7 was combined with Unit 10
- Unit 37 was combined with Unit 14
- Unit 54 was combined with Unit 53
- Unit 56 was combined with Unit 38

Unit 69 was changed to Unit 75 so the aspen treatment units would be numbered between 70 and 79. The burn blocks were reconfigured so they referred to prescribed burn areas only. Burn blocks F and G were withdrawn from the analysis because the whole area of the burn blocks is proposed for commercial or non-commercial harvest. A portion of burn blocks C and E were re-numbered C2 and E2, respectively, because the prescribed fire treatments are separated by mechanical treatments. Burn block H was modified to exclude prescribed fire from the seed production area.

The access to Unit 41 was changed because excessive side slopes on the proposed route prohibit road construction. The new route, though longer, has a manageable grade and avoids the steepest sideslopes. Access to the Bitterroot Irrigation District (BRID) road was changed. The new proposed location accesses the ditch road near the siphon and eliminates the need to build a crossing over the irrigation ditch. The access to Unit 50 changed from building a steep, temporary road from the end of NFSR 62945 to constructing a new national forest system road on the contour, north from NFSR 62945 and connecting it to a temporary road and skid trail on the ridge. The new road would have a much gentler grade and would be outside of the riparian areas.

2.2.2.1 Alternative Description

In the 5,711-acre project area, approximately 1,680 acres of ponderosa pine and 189 acres of lodgepole pine forest would be treated to reduce their susceptibility to mountain pine beetle infestation under Alternative 2. Another 288 acres would be treated to reduce dwarf mistletoe and Douglas-fir beetle hazard. Commercial timber harvest would occur on 1,476 acres and the remaining 531 acres would be non-commercial thin treatments. All treated units would be followed with a post-harvest review that would evaluate the need for additional non-commercial thinning, slash piling, and the type of slash treatment.

Low severity prescribed fire would follow most of the treatments in commercial harvest units. In addition, low severity fires would be prescribed on 765 acres (Units A, B, C2, D, E2, and H) and moderate severity fire would be prescribed on 542 acres (Units C and E) outside of harvest or thinning treatment units. Fuels would be reduced on 1,999 acres using commercial and non-commercial harvest followed by prescribed fire, on 1,307 acres using prescribe fire only, and on eight acres using harvest treatment only. Approximately 67% (2,236 acres) of the treated area is in the wildland-urban interface (WUI) (Table 2.2-2).

Approximately 1.7 miles of new system road, 2.0 miles of temporary road, and 2.7 miles of tracked line-machine (TLM) trail would be constructed to access timber (Figure 2.2- 2). Individual lengths of road or trail vary between 69 and 5,667 feet (Table 2.2-2). New system roads would be stored following timber harvest and temporary road, and tracked line-machine trails would be rehabilitated (Table 2.2- 5).

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Table 2.2- 2: Proposed Treatments for each Unit in Alternative 2.

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
1	Uneven-age, single tree selection	42	5	33	0	0	0	311
3	Intermediate harvest (<18"DBH)	20	0	20	0	0	0	86
4	Group Selection	10	0	0	5	0	0	824
5	Group Selection	24	8.5	0	10	0	0	2826
6	Group Selection	21	0	0	8	0	0	0
8	Intermediate Harvest	38	38	0	38	0	0	2933
9	Intermediate Harvest	21	21	21	0	0	0	0
10	Intermediate Harvest	59	59	35	0	0	0	0
11	Non-commercial Thin	NO TREATMENT						
12	Uneven-age, single tree	199	199	166	0	0	0	0
13	Non-commercial Thin	57	57	N/A	N/A	N/A	N/A	N/A
14	Non-commercial Thin	88	88	N/A	N/A	N/A	N/A	N/A
15	Intermediate Harvest	3	0	0	3	0	0	953
16N	Group Selection	9	9	0	9	0	0	512
16S	Intermediate Harvest	8	8	1	7	0	0	1250
17	Intermediate Harvest	21	21	13	0	0	0	0
18	Intermediate Harvest	31	31	29	0		0	0
19	Intermediate Harvest	14	14	0	14	0	0	0
20	Intermediate Harvest	8	8	0	8	0	1950	0
21	Intermediate Harvest	10	10	0	10	0	0	0
22	Intermediate Harvest	NO TREATMENT						
22A	Non-commercial Thin	NO TREATMENT						
23	Intermediate Harvest	NO TREATMENT						
23A	Non-commercial Thin	NO TREATMENT						
24	Non-commercial Thin	35	35	N/A	N/A	N/A	N/A	N/A
25	Intermediate Harvest	15	15	15	0	0	0	0
26	Intermediate Harvest	52	52	52	0	0	0	0
27	Intermediate Harvest	26	26	0	26	0	0	0
28	Intermediate Harvest	50	50	44	0	0	2184	0
32	Intermediate Harvest	9	9	9	0	0	0	72
34	Intermediate Harvest	17	17	5	0	0	0	68
36	Non-commercial Thin	204	204	N/A	N/A	N/A	N/A	N/A
38	Group Selection	34	34	12	0	0	1446	0
39	Uneven-age, single tree selection	101	0	75	0	0	0	0
41	Group Selection	24	24	0	12	5667	0	0
42	Group Selection	25	25	13	0	0	0	0
43	Non-commercial thin	34	3.5	N/A	N/A	N/A	N/A	N/A
45	Group Selection	87	6	17	0	0	0	0
46	Intermediate Harvest	14	0.2	0	14	0	0	2318
47	Intermediate Harvest	5	4	0	5	0	0	0
48	Intermediate Harvest	5	0	5	0	0	0	0

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
49	Intermediate Harvest	45	0	31	0	0	0	0
50	Intermediate Harvest	47	29	25	0	1449	1597	0
51	Non-commercial thin	47	0	N/A	N/A	N/A	N/A	N/A
52	Non-commercial thin	9	9	N/A	N/A	N/A	N/A	N/A
53	Intermediate Harvest	249	249	212	0	2078	0	0
57	Group Selection	29	29	6	0	0	0	0
58	Group Selection	4	4	0	2	0	227	0
59	Intermediate Harvest	5	5	5	0	0	0	0
60	Group Selection	21	21	0	6	0	0	1841
61	Intermediate Harvest	27	27	35	0	0	0	0
62	Intermediate Harvest	30	30	21	0	0	2226	0
64	Non-commercial thin	57	57	N/A	N/A	N/A	N/A	N/A
65	Intermediate Harvest	17	17	10	0	0	812	0
66	Non-commercial thin	NO TREATMENT						
66A	Non-commercial thin	NO TREATMENT						
70	Aspen treatment	NO TREATMENT						
73	Aspen treatment	NO TREATMENT						
74	Aspen treatment	NO TREATMENT						
75	Aspen treatment	NO TREATMENT						
A	Prescribed Fire	30	30	N/A	N/A	N/A	N/A	N/A
B	Prescribed Fire	452	452	N/A	N/A	N/A	N/A	N/A
B2	Prescribed Fire	INCLUDED IN UNIT B						
C	Prescribed Fire	171	0	N/A	N/A	N/A	N/A	N/A
C2	Prescribed Fire	63	0	N/A	N/A	N/A	N/A	N/A
D	Prescribed Fire	74	74	N/A	N/A	N/A	N/A	N/A
E	Prescribed Fire	371	0	N/A	N/A	N/A	N/A	N/A
E2	Prescribed Fire	26	0	N/A	N/A	N/A	N/A	N/A
G	Prescribed Fire	NO TREATMENT						
H	Prescribed Fire	120	120	N/A	N/A	N/A	N/A	N/A
TOTALS		3314	2236	909	177	9,194	10,442	13,994
Percentage of treated area		67	67	84[2]	16[2]	(1.74mi)	(1.98 mi)	(2.65 mi)

[1]TLM: tracked line-machine trail

[2]Percentage base is the area of potential harvest not the total unit area, 1,086 acres.

2.2.3 Alternative 3 – No New Road Construction

The Forest Service developed Alternative 3 in response to public comments opposed to the construction of new roads. In this alternative no new system or temporary roads would be constructed and no tracked line-machine trails would be developed. Units 2, 4, 5, 16, 20, 28, 29, 30, 32, 34, 38, 41, 46, 60, and 65 that would require these facilities were withdrawn from analysis (Figure 2.2- 3). The parts of Units 50 and 62 that could be treated from current access points were retained in the analysis. We added two non-commercial thin units in ponderosa pine plantations (Units 66 and 66A). Slash would be assessed to determine whether levels exceed characteristic fuel loads in these two units. Fuels below characteristic levels would be scattered but not burned following treatment. If fuels exceed levels characteristic of the site, the excess fuels would be piled and burned.

Rocky Mountain Research Station foresters monitoring treatments established in the 1990s as part of the Lick Creek Environmental Assessment requested the inclusion of follow-up treatments as part of the Como Forest Health project. Since this request came after the proposed action was sent out for scoping and the request does not require the construction of new roads or tracked line-machine trail, the units were included in this alternative. The numbers of the research units are: 11, 22, 22A, 23, and 23A (Table 2.2- 3). Unit 40 would be treated under Alternative 3 because Unit 23 also requires skyline equipment.

Burn units A, B2, C2, and E2 would be thinned before the prescribed fire is ignited to improve conditions appropriate for a low severity burn. Prescribed fire treatments in burn blocks F and H were absorbed by timber harvest and thinning units (Figure 2.2- 3). A small fragment of burn block G remains.

2.2.3.1 Alternative Description

Under Alternative 3, approximately 1987 acres of ponderosa pine and 189 acres of lodgepole pine forest would be treated to reduce their susceptibility to mountain pine beetle infestation. Another 162 acres are treated to reduce dwarf mistletoe and Douglas-fir beetle hazard. Commercial timber harvest would occur on 1,292 acres and the remaining 924 acres would be non-commercial thin treatments. All treated units would be followed with a post-harvest review that would evaluate the need for additional non-commercial thinning, slash piling, and the type of slash treatment.

A low severity prescribed fire would follow most of the treatments in commercial harvest units. In addition, low severity fires would be prescribed on 401 acres and moderate severity fire would be prescribed on 542 acres outside of harvest or thinning treatment units. Fuels would be reduced on 2,163 acres using commercial and non-commercial harvest followed by prescribed fire, on 53 acres using harvest treatments only, and on 943 acres using prescribe fire only. Approximately 65% (2059 acres) of the treatments are in the wildland-urban interface (WUI) (Table 2.2-2).

Table 2.2- 3: Proposed Treatments for each Unit in Alternative 3

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
1	Uneven-age, single tree selection	26	0	26	0	0	0	0
3	Intermediate Harvest (<20"DBH)	20	0	20	0	0	0	0
4	Group Selection	NO TREATMENT						
5	Group Selection	NO TREATMENT						
6	Group Selection	21	0	0	8	0	0	0
8	Non-commercial thin	38	38	0	0	N/A	N/A	N/A
9	Intermediate Harvest	21	21	21	0	0	0	0
10	Intermediate Harvest	59	59	35	0	0	0	0
11	Non-commercial Thin	50	50	N/A	N/A	N/A	N/A	N/A
12	Uneven-age, single tree selection	199	199	166	0	0	0	0
13	Non-commercial Thin	57	57	N/A	N/A	N/A	N/A	N/A
14	Non-commercial Thin	88	88	N/A	N/A	N/A	N/A	N/A
15	Non-commercial thin	3	3	0	0	0	0	0
16N	Group Selection	NO TREATMENT						
16S	Intermediate Harvest	NO TREATMENT						

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
17	Intermediate Harvest	21	21	13	0	0	0	0
18	Intermediate Harvest	31	31	29	0	0	0	0
19	Intermediate Harvest	14	14	0	14	0	0	0
20	Intermediate Harvest	NO TREATMENT						
21	Intermediate Harvest	10	10	0	10	0	0	0
22	Intermediate Harvest	76	48	74	0	0	0	0
22A	Non-commercial Thin	16	11	N/A	N/A	N/A	N/A	N/A
23	Intermediate Harvest	79	30	58	5	0	0	0
23A	Non-commercial Thin	3	3	N/A	N/A	N/A	N/A	N/A
24	Non-commercial Thin	35	35	N/A	N/A	N/A	N/A	N/A
25	Intermediate Harvest	15	15	15	0	0	0	0
26	Intermediate Harvest	52	52	52	0	0	0	0
27	Intermediate Harvest	26	26	0	26	0	0	0
28	Intermediate Harvest	NO TREATMENT						
32	Intermediate Harvest	NO TREATMENT						
34	Intermediate Harvest	NO TREATMENT						
36	Non-commercial Thin	204	204	N/A	N/A	N/A	N/A	N/A
38	Group Selection	NO TREATMENT						
39	Uneven-age, single tree selection	101	0	75	0	0	0	0
40	Intermediate Harvest	7	0	0	7	0	0	0
41	Group Selection	NO TREATMENT						
42	Group Selection	25	25	13	0	0	0	0
43	Non-commercial thin	34	4	N/A	N/A	N/A	N/A	N/A
45	Group Selection	87	6	17	0	0	0	0
46	Intermediate Harvest	NO TREATMENT						
47	Intermediate Harvest	5	4	0	5	0	0	0
48	Intermediate Harvest	5	0	5	0	0	0	0
49	Intermediate Harvest	45	0	31	0	0	0	0
50	Intermediate Harvest	21	19	11	0	0	0	0
51	Non-commercial thin	7	0	N/A	N/A	N/A	N/A	N/A
52	Non-commercial thin	9	9	N/A	N/A	N/A	N/A	N/A
53	Intermediate Harvest	249	249	212	0	0	0	0
57	Group Selection	29	29	6	0	0	0	0
58	Group Selection	NO TREATMENT						
59	Intermediate Harvest	5	5	5	0	0	0	0
60	Group Selection	NO TREATMENT						
61	Intermediate Harvest	27	27	35	0	0	0	0
62	Intermediate Harvest	16	16	16	0	0	0	0
64	Non-commercial thin	57	57	N/A	N/A	N/A	N/A	N/A
65	Intermediate Harvest	NO TREATMENT						
66	Non-commercial thin	27	27	N/A	N/A	N/A	N/A	N/A
66A	Non-commercial thin	18	18	N/A	N/A	N/A	N/A	N/A
70	Aspen treatment	NO TREATMENT						
73	Aspen treatment	NO TREATMENT						
74	Aspen treatment	NO TREATMENT						
75	Aspen treatment	NO TREATMENT						

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
A	Prescribed Fire with non-commercial thin	24	24	N/A	N/A	N/A	N/A	N/A
B	Prescribed Fire	306	306	N/A	N/A	N/A	N/A	N/A
B2	Prescribed Fire with non-commercial thin	124	124	N/A	N/A	N/A	N/A	N/A
C	Prescribed Fire	171	0	N/A	N/A	N/A	N/A	N/A
C2	Prescribed Fire with non-commercial thin	104	0	N/A	N/A	N/A	N/A	N/A
D	Prescribed Fire	80	80	N/A	N/A	N/A	N/A	N/A
E	Prescribed Fire	371	0	N/A	N/A	N/A	N/A	N/A
E2	Prescribed Fire with non-commercial thin	26	0	N/A	N/A	N/A	N/A	N/A
G	Prescribed Fire	15	15	N/A	N/A	N/A	N/A	N/A
H	Prescribed Fire	NO TREATMENT						
TOTALS		3159	2059	935	75	0	0	0
Percentage of treated area		55	65	93[2]	7			

[1]TLM: tracked line-machine trail
[2]Percentage base is the area of potential harvest not the total unit area, 1,010 acres.

2.2.4 Alternative 4 – Conservation of Habitat Diversity and Visual Quality

Alternative 4 was developed to place stronger emphasis on conserving wildlife habitat and visual quality while meeting the purpose and need for the Como Forest Health Project. Management areas in the project area emphasize big-game winter range (52% of the project area), forage (86%), and cover (26%). Old growth should be eight percent, in each third order drainage in over 78% of the project area. Public comments noted the potential conflict between implementing the proposed action and conserving or enhancing wildlife habitat.

Visual quality is also an important consideration in this project area. Management areas in the Como Forest Health project area span the range of visual quality objectives from maximum modification to retention. In this alternative, units that would cause long-term changes to the landscape character are not treated with commercial harvest.

Aspen clones are treated in this alternative to promote wildlife habitat diversity (Figure 2.2 4). In most of the aspen clones, the treatments consist of cutting or girdling conifers that shade the aspen and inhibit their growth and development. The treatments provide understory structure and snags.

Conifers would be slashed, girdled, or removed from aspen units. In Unit 70, conifers less than 12 inches DBH would be slashed and trees greater than 12 inches DBH would be girdled. In units 73 and 74 commercial-sized conifers would be removed and non-commercial conifers would be slashed. In Unit 75, spruce would be cut and left on site, smaller diameter conifers would be slashed, and declining aspen may be girdled. Dead conifers would be left uncut. Trees greater than 18 inches DBH in Unit 75 would not be harvested but commercial-sized volume would be removed from the northeast part of the unit.

Operation of logging equipment in RHCAs would follow the Stream Management Zones (SMZ) law and regulation (MT DNRC 2006). Logging machinery would avoid entering the RHCAs. Loggers will

manually fall the trees and winch them out of the RHCA with cables and chokers. A skid trail between the two halves of Unit 74 would be used by machinery, probably a skidder. These treatments would promote the long-term ecological integrity of aspen and associated vegetation and wildlife species, and would not affect native fish (INFISH Standard and Guideline for Watershed Restoration and Habitat WR-1).

2.2.4.1 Alternative Description

Under Alternative 4, approximately 1,570 acres of ponderosa pine forest would be treated to reduce their susceptibility to mountain pine beetle infestation. In addition, conifers would be girdled, slashed or removed from about 39 acres of aspen to rejuvenate the aspen clones. In aspen unit 70 felled conifers would be left on site because equipment to remove the logs could not access the wetlands (Figure 2.2- 4). Aspen units 73 and 74 are within Units 10 and 17, respectively, so felled conifers would be cabled to adjacent areas outside of the RHCA. Commercial timber harvest would occur on 1,115 acres and the remaining 745 acres would be non-commercial thin treatments. All treated units would be followed with a post-harvest review that would determine the need for additional non-commercial thinning, slash piling, and the type of slash treatment.

Low severity prescribed fire would follow most of the treatments in commercial harvest units. In addition, low severity fires would be prescribed on 31 acres and moderate severity fire would be prescribed on 171 acres outside of harvest or thinning treatment units. Fuels would be reduced on 1,857 acres using using commercial and non-commercial harvest followed by prescribed fire, on 48 acres using harvest treatments only, and on 202 acres using prescribe fire only. Approximately 72% (1,509 acres) of the treatments are in the WUI (Table 2.2- 44).

Approximately 0.7 miles of new system road, 1.1 miles of temporary road, and 0.62 mile of tracked line-machine (TLM) trail would be constructed to access timber (Figure 2.2- 4). Individual lengths of road or trail vary between 69 and 2,226 feet (Table 2.2- 4). New National Forest System road would be stored as in Alternative 2.

Table 2.2- 4: Proposed Treatments for each Unit in Alternative 4

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
1	Uneven-age, single tree selection	42	5	33	0	0	0	497
3	Intermediate harvest (<20"DBH)	NO TREATMENT						
4	Group Selection	NO TREATMENT						
5	Group Selection	NO TREATMENT						
6	Group Selection	NO TREATMENT						
8	Non-commercial thin	38	38	N/A	N/A	N/A	N/A	N/A
9	Intermediate Harvest	23	23	21	0	0	0	0
10	Intermediate Harvest	47	47	27	0	0	0	0
11	Non-commercial Thin	50	50	N/A	N/A	N/A	N/A	N/A
12	Uneven-age, single tree selection	199	199	166	0	0	0	0
13	Non-commercial Thin	NO TREATMENT						
14	Non-commercial Thin	88	88	N/A	N/A	N/A	N/A	N/A
15	Intermediate Harvest	3	3	0	3	0	0	1410
16N	Group Selection	NO TREATMENT						

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
16S	Intermediate Harvest	8	8	1	7	0	0	1,250
17	Intermediate Harvest	21	21	13	0	0	0	0
18	Intermediate Harvest	31	31	29	0	0	0	0
19	Intermediate Harvest	14	14	0	14	0	0	0
20	Intermediate Harvest	NO TREATMENT						
21	Intermediate Harvest	10	10	0	10	0	0	0
22	Intermediate Harvest	76	48	74	0	0	0	0
22A	Non-commercial Thin	16	11	N/A	N/A	N/A	N/A	N/A
23	Intermediate Harvest	79	30	58	5	0	0	0
23A	Non-commercial Thin	3	3	N/A	N/A	N/A	N/A	N/A
24	Non-commercial Thin	NO TREATMENT						
25	Intermediate Harvest	NO TREATMENT						
26	Intermediate Harvest	NO TREATMENT						
27	Intermediate Harvest	NO TREATMENT						
28	Intermediate Harvest	50	50	44	0	0	2184	0
32	Intermediate Harvest	6	6	6	0	0	0	73
34	Intermediate Harvest	11	11	5	0	0	0	69
36	Non-commercial Thin	204	204	N/A	N/A	N/A	N/A	N/A
38	Group Selection	NO TREATMENT						
39	Uneven-age, single tree selection	101	0	75	0	0	0	0
40	Intermediate Harvest	7	0	0	7	0	0	0
41	Group Selection	NO TREATMENT						
42	Group Selection	NO TREATMENT						
43	Non-commercial thin	34	4	N/A	N/A	N/A	N/A	N/A
45	Group Selection	NO TREATMENT						
46	Intermediate Harvest	NO TREATMENT						
47	Intermediate Harvest	NO TREATMENT						
48	Intermediate Harvest	5	0	5	0	0	0	0
49	Intermediate Harvest	45	0	31	0	0	0	0
50	Intermediate Harvest	41	25	25	0	1449	1597	0
51	Non-commercial thin	NO TREATMENT						
52	Non-commercial thin	NO TREATMENT						
53	Intermediate Harvest	239	239	212	0	2079	0	0
57	Group Selection	NO TREATMENT						
58	Group Selection	NO TREATMENT						
59	Intermediate Harvest	5	5	5	0	0	0	0
60	Group Selection	NO TREATMENT						
61	Intermediate Harvest	27	27	35	0	0	0	0
62	Intermediate Harvest	25	25	21	0	0	2226	0
64	Non-commercial thin	57	57	N/A	N/A	N/A	N/A	N/A
65	Intermediate Harvest	NO TREATMENT						
66	Non-commercial thin, No Prescribed Fire	27	27	N/A	N/A	N/A	N/A	N/A
66A	Non-commercial thin, No Prescribed Fire	NO TREATMENT						
70	Aspen treatment	8	8	N/A	N/A	N/A	N/A	N/A

Unit No.	Treatment*	Area (acre)	WUI Area (acre)	Yarding Method		Road & Trail Construction		
				Ground (acre)	Cable (acre)	System (ft)	Temp. (ft)	TLM[1]/ excavated skid (ft)
73	Aspen treatment	(12)	(12)	5	N/A	N/A	N/A	N/A
74	Aspen treatment	(6)	(6)	6	N/A	N/A	N/A	N/A
75	Aspen treatment	13	13	3	N/A	N/A	N/A	N/A
A	Prescribed Fire	24	24	N/A	N/A	N/A	N/A	N/A
B	Prescribed Fire	NO TREATMENT						
B2	Prescribed Fire with non-commercial thin	124	124	N/A	N/A	N/A	N/A	N/A
C	Prescribed Fire	171	0	N/A	N/A	N/A	N/A	N/A
C2	Prescribed Fire with non-commercial thin	104	0	N/A	N/A	N/A	N/A	N/A
D	Prescribed Fire	31	31	N/A	N/A	N/A	N/A	N/A
E	Prescribed Fire	NO TREATMENT						
E2	Prescribed Fire	NO TREATMENT						
G	Prescribed Fire	NO TREATMENT						
H	Prescribed Fire	NO TREATMENT						
TOTALS		2107	1509	903	46	3528	6007	3299
Percentage of treated area		37	72	95[2]	5	(0.67mi)	(1.14 mi)	(0.62mi)

[1] TLM: Tracked line-machine; a cable yarding system

[2] Percentage base is the area of potential harvest not the total unit area, 949 acres

2.2.5 Features Common to All Action Alternatives

2.2.5.1 Roads Management

There are just over 7 miles of undetermined roads in the Como Forest Health project area. Undetermined roads are old roads whose future needs have not been determined. The Interdisciplinary Team (ID Team) assessed these roads during field reviews and determined which roads were needed for current and future management. Most of these roads are connected to road systems that are designated closed. In all the action alternatives approximately 0.6 miles of road would remain open, 3.1 miles of road would be stored, and the remaining 3.5 miles would be decommissioned (Figure 2.2- 2 –Figure 2.2- 4). No additional rehabilitation work or soil disturbance is needed to decommission the roads because they are stable and grown in with large trees.

Approximately 0.5 mile of national forest system road would be decommissioned, NFSR 62939 and 62945. The end of NFSR 62939 is a redundant road that is no longer needed to access timber. The first 100 feet of this road would be recontoured. The end of NFSR 62945 is a steep section of road that is downcutting and eroding. The road would be obliterated from the junction with the new proposed road. Obliteration would require improving drainage to prevent erosion, decompacting the road surface, and recontouring where material is available. The road would be fertilized, seeded, and mulched. Slash and rock would be used to reinforce the closure.

Stored roads, specifically NFSR 62937, 62938, and 62963, will have the culverts removed, drainage re-established in place of the culvert, the surfaces scarified and seeded, and the entrance recontoured for the first 100 feet.

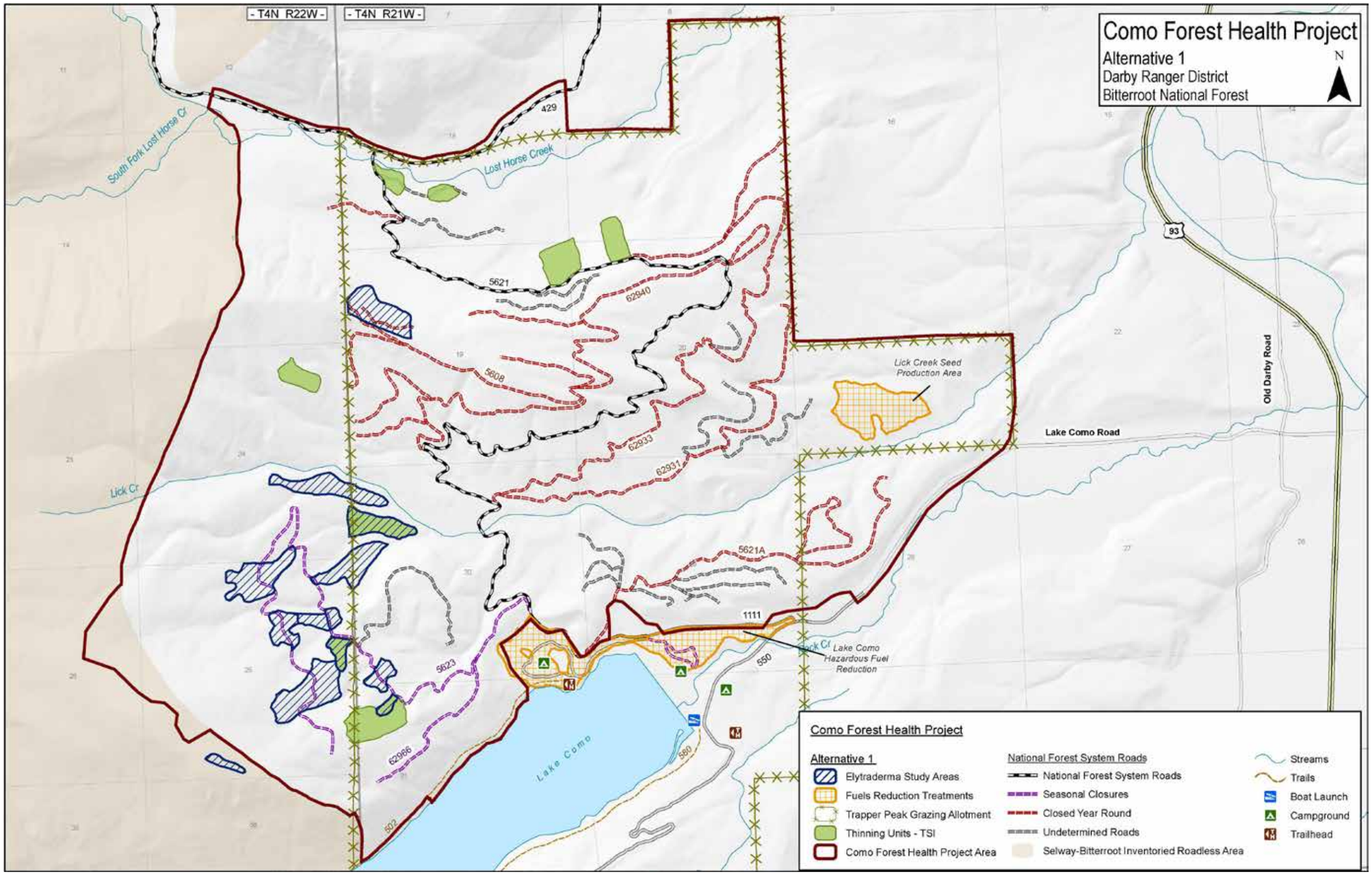

Figure 2.2- 1: Como Forest Health Project Area showing current activities under Alternative 1, No Action alternative.

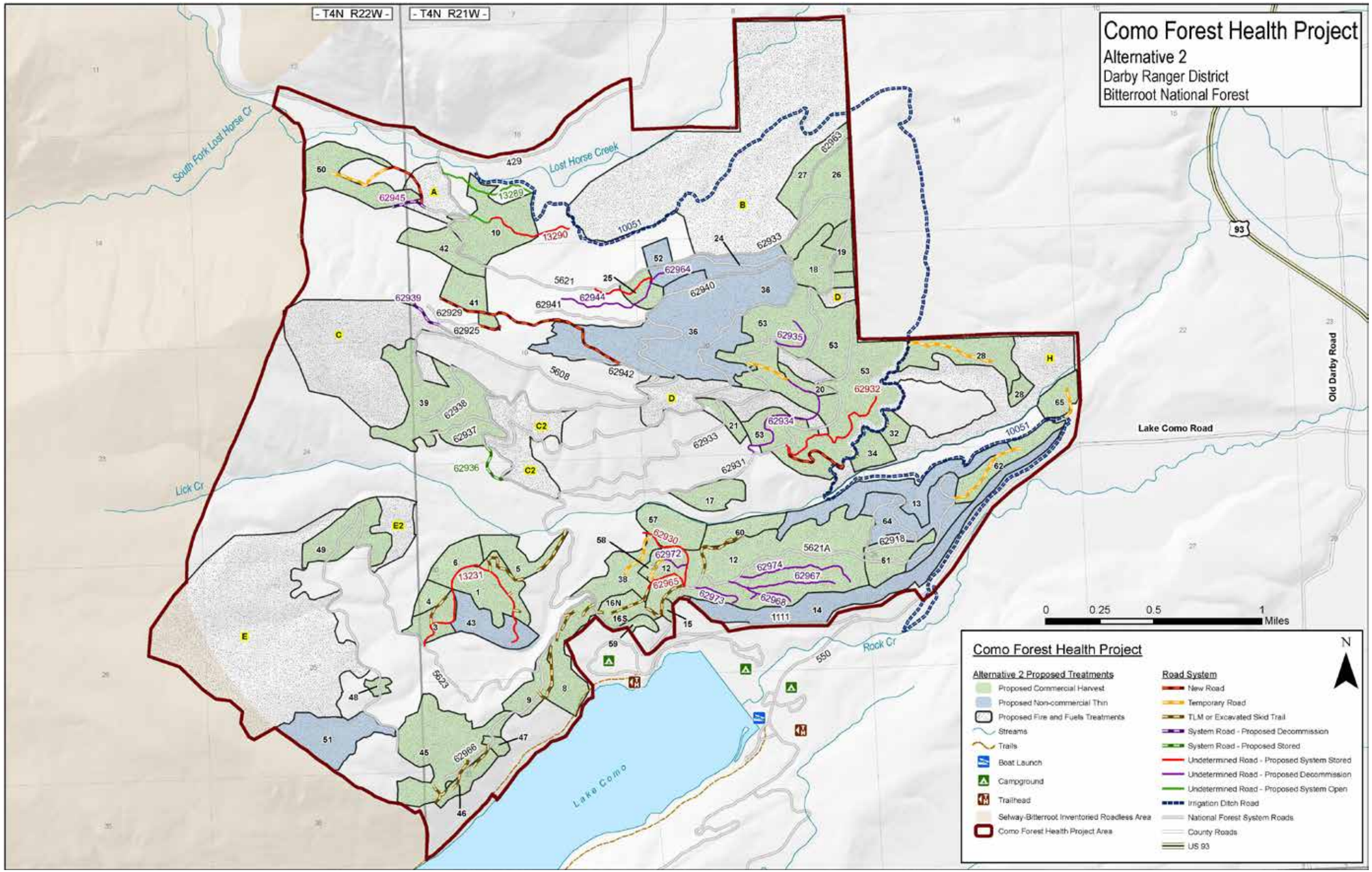

Figure 2.2- 2: Proposed Treatments in Alternative 2 of the Como Forest Health

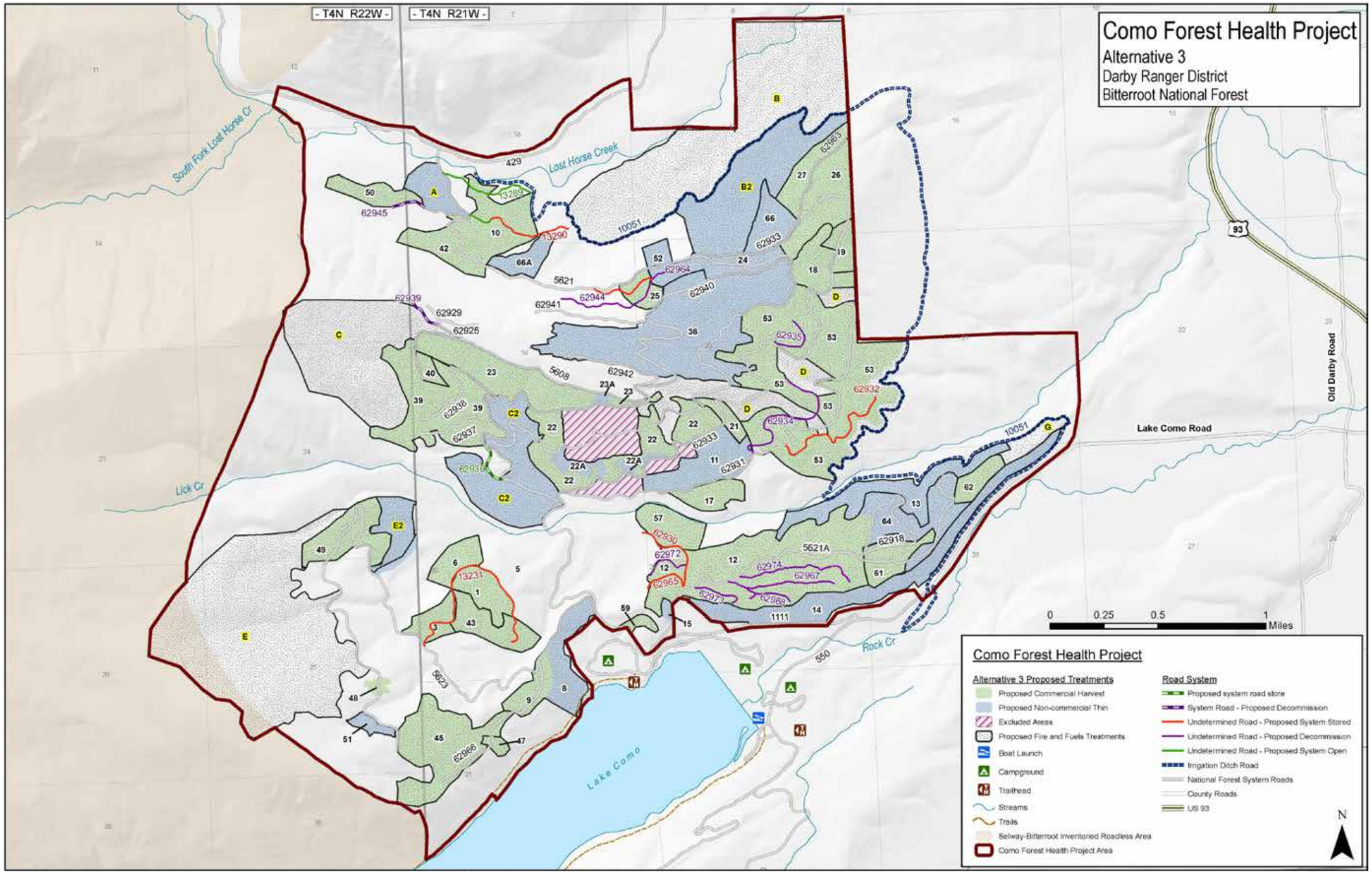

Figure 2.2- 3: Proposed Treatments in Alternative 3 of the Como Forest Health Project

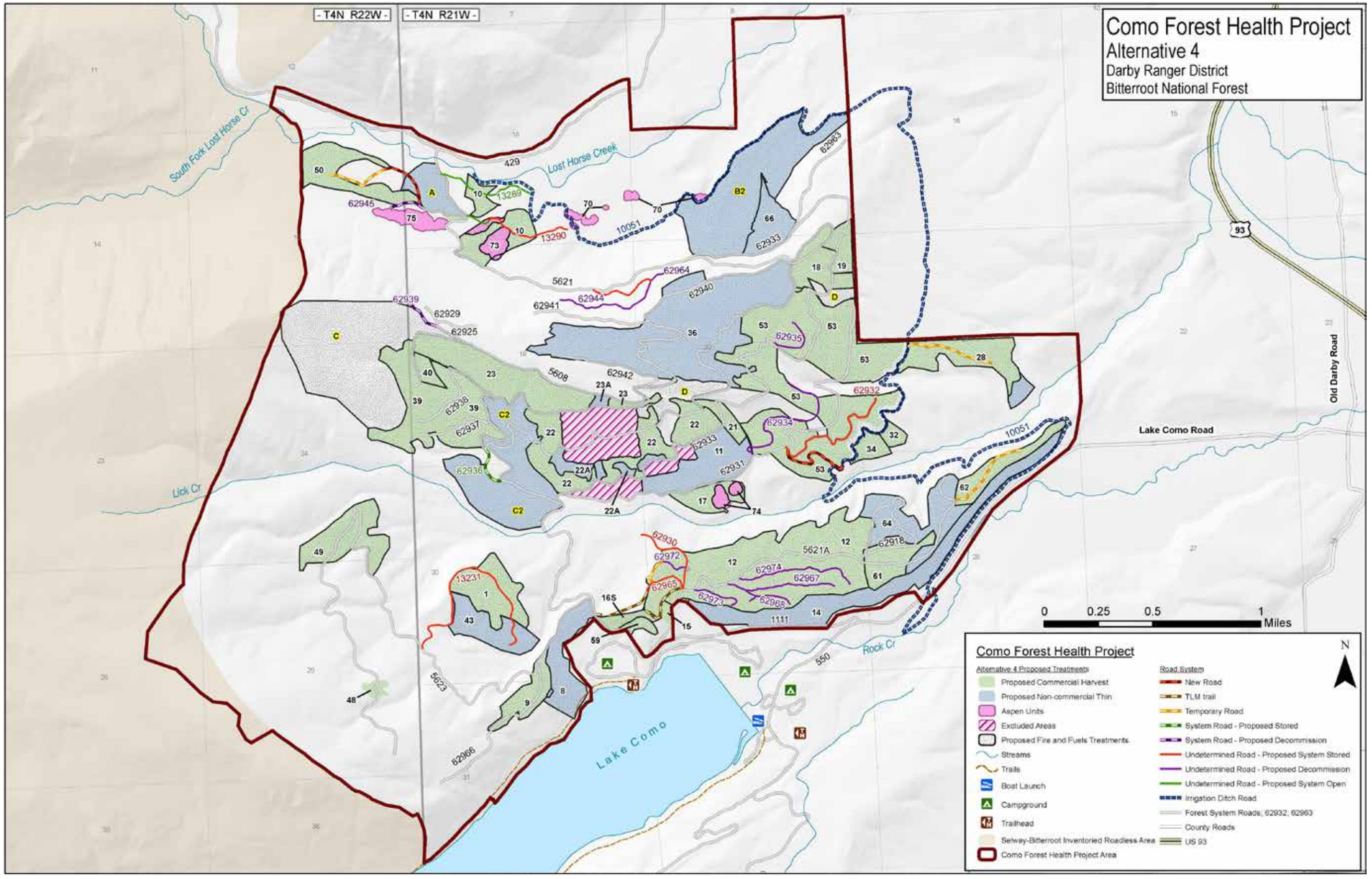

Figure 2.2- 4: Proposed Treatments in Alternative 4 of the Como Forest Health Project

Watershed Improvement Treatments –

All action alternatives would implement four watershed improvement activities to reduce sediment (Figure 3.7-1). The activities would be funded by stewardship funds or other funding sources. The activities would be implemented when funding allows, but most likely between the start of the timber sale and 1-2 years after the timber sale closure. The watershed improvement activities are:

- Stabilize NFSR 62936 borrow pit and road: the road and borrow pit would be closed to motorized vehicles, lightly scarified, water barred where needed, seeded and mulched.
- NFSR 5621 culvert replacement on NFSR 5621, at the first intermittent stream crossing north of NFSR 5608 junction to stabilize the channel.
- NFSR 62931 culvert replacement at NFSR 5621 junction.
- Closure of an unauthorized OHV trail at the NFSR 5608/NFSR 5621 junction.

2.2.5.2 Design Features and Mitigation Measures

The Forest Service developed the following design features and mitigation measures to be used as part of all of the action alternatives. Design features are standard operating procedures or actions the Forest Service is directed to take by law, regulation, or policy. Mitigation measures are additional actions the Forest Service will take to prevent or reduce a potential effect.

The design features and the objectives that would be achieved are described in Table 2.2- 5.

Table 2.2- 5: Design Features for the Como Forest Health Project

<table>
<tr><th>OBJECTIVE</th><th>DESIGN FEATURE</th></tr>
<tr><td colspan="2">SOILS</td></tr>
<tr><td>Minimize soil erosion and compaction</td><td>Activities will comply with Best Management Practices (BMPs) to minimize effects on soil resources. Not all BMPs are listed in this table of Design Features. A complete list of BMPs is in Appendix A and complete descriptions are available in the Project File.</td></tr>
<tr><td>Minimize soil compaction</td><td>Winter ground-based yarding operations will maintain the following combination of snow depth and frozen soil conditions

<table>
<tr><th>Depth of compacted (by equipment) snow under wheels or track tread</th><th>Minimum thickness of solidly frozen soil needed below compacted snow layer</th></tr>
<tr><td>10 or more inches</td><td>0 inches</td></tr>
<tr><td>7 to 10 inches</td><td>1 inch</td></tr>
<tr><td>4 to 7 inches</td><td>2 inches</td></tr>
<tr><td>less than 4 inches</td><td>4 inches</td></tr>
</table>
*Pre-trailing. Pre-trailing selected skid trails a day or so prior to skidding or other heavy trail use is a way to achieve this objective. If average, pre-compacted snow depth along the proposed trail is more than 15 inches, pre-trailing can be done whether or not the soil is frozen. If pre-compacted snow depth is 8 to15 inches; pre-trailing should be done only if the soil is solidly frozen in the top one inch or more. Otherwise, pre-trailing should be delayed until more snow falls to accumulate to the 15 inch or more depth. To further aid soil protection, pre- trailing should be done using an “easy-does-it” approach, including slow ground speeds and steady movements. Avoid spinning tires and bouncing equipment around on trails as much as possible. Adequate pre-trailing air temperatures generally are in the low 20’s Fahrenheit or lower. For more information about pre-trailing conditions, consult with the Forest soil scientist.</td></tr>
</table>

<table>
<tr><th>OBJECTIVE</th><th>DESIGN FEATURE</th></tr>
<tr><td></td><td>Skid trails will be designated and historic trails and road prisms will be used as skid trails to the extent feasible</td></tr>
<tr><td></td><td>Summer ground-based yarding will occur when soils are dry (soil moisture is near or below the permanent wilting point)</td></tr>
<tr><td>Reduce detrimental soil disturbance (DSD)</td><td>Track-line machine units will have constructed trail. All log decking and skidding of volume/trees from track-line machine units will occur on the constructed trails in order to minimize soil disturbance. Similar to temporary roads, all track-line machine trails will be obliterated and rehabilitated upon completion of harvest activities.</td></tr>
<tr><td></td><td>Rehabilitation activities on temporary road construction would include recontouring, slashing, mulching, seeding with an approved native seed mixture, and fertilizing with an approved organic fertilizer.</td></tr>
<tr><td></td><td>Pile burning should occur during moist conditions to minimize duff consumption and high severity burn impacts on soils.</td></tr>
<tr><td></td><td>Hand pile sizes inside units will average 6-8 feet in diameter so localized areas of soil disturbance will be less than about 50 square feet. This does not pertain to slash created on landings during yarding operations. (Individual hand piles will generally not exceed 50 ft2 (pile size approximately 6 to 8 ft in diameter</td></tr>
<tr><td></td><td>Where feasible, pile and burn slash where detrimental soil disturbance already exists, such as on old log landings and skid trails</td></tr>
<tr><td>Reduce DSD and prevent the spread of noxious weeds</td><td>Undetermined roads used for hauling will be stabilized by removing drainage structures; ripping, seeding, and fertilizing the road bed; and closing the road entrance.</td></tr>
<tr><td>Maintain soil productivity</td><td>Upon completion of commercial harvest and prescribed fire activities, the following levels of coarse woody material (greater than 3 inches diameter) shall be left. This material will include the combination of standing dead as well as down woody fuels.
<table>
<tr><th>Units</th><th>Fire Group</th><th>Coarse Woody Debris</th></tr>
<tr><td></td><td>Warm, Dry Ponderosa Pine and Douglas-fir (FG-2 & 4)</td><td>5-10 tons/acre</td></tr>
<tr><td></td><td>Cool, Dry or Moist Douglas-fir (FG-5, 6)</td><td>10-20 tons/acre</td></tr>
<tr><td></td><td>Cool Sites Usually Dominated by Lodgepole Pine (FG-7) Dry, Lower Subalpine (FG-7) Moist, Lower Subalpine (FG-9)</td><td>8-24 tons/acre</td></tr>
</table></td></tr>
<tr><td></td><td>Wood larger than 15 inches in diameter will not be intentionally ignited during hand lighting. It is understood that once hand crews light the fire, fire may burn into and combust some large CWD.</td></tr>
<tr><td></td><td>Allow time for nutrients to leach from slash prior to burning. The slash will be left through one winter after cutting to allow for initial decomposition and nutrient leaching.</td></tr>
<tr><td></td><td>Upon completion of prescribed fire or maintenance burning, at least 70 percent ground cover is necessary to prevent detrimental accelerated erosion and loss of soil productivity. In those cases where ground cover is less than 70 percent prior to burning, consumption and loss of ground cover should not exceed 15 percent. Ground cover includes duff, organic soil horizons, basal area of vegetation, fine woody debris, coarse woody debris, and surface coarse fragments. In those cases where ground cover is less than 70 percent prior to burning, fuel consumption and ground cover loss should</td></tr>
</table>

OBJECTIVE	DESIGN FEATURE
	not exceed 15 percent. Prescribed fire prescriptions will be designed to meet these soil protection requirements.
	The silvicultural prescriptions will be designed to account for future large CWD (>15 inches diameter) recruitment that will meet acceptable levels in stands where CWD is less than minimum levels before treatment. CWD will be left in these stands to the extent feasible to meet minimum requirements that do not pose a fuels hazard. High amounts of small CWD (3-15 inches diameter) may present wildfire risks.
	CWD will generally be evenly distributed on each acre, unless otherwise agreed to by the Contracting Officer or their designee
WATERSHED AND FISHERIES	
Ensure that within the Riparian Habitat Conservation Areas (RHCAs) the riparian dependent resources receive primary emphasis. And, Ensure that the Montana Streamside Management Zone Laws and INFISH requirements are met.	The standard INFISH (USDA Forest Service 1995) RHCAs will be applied. A map of these areas is located in PF-Fish-001. They are: 300 feet on each side of fish-bearing streams 150 feet on each side of permanently flowing, non-fish bearing streams 100 feet on each side of seasonally flowing or intermittent streams 150 feet on each side of ponds, lakes or wetlands > 1 acre in area 100 feet on each side of ponds, lakes or wetlands < 1 acre in area 100 feet of landslide prone areas.
	RHCA boundaries will be designated and marked on the ground in consultation with the fish biologist or hydrologist.
	In RHCAs, trees can be felled when they pose a safety risk. Felled hazard trees will be left on-site (INFISH standard RA-2), unless their removal is deemed necessary for safety reasons by the TSA.
	Generally, trees will not be harvested from Riparian Habitat Conservation Areas (RHCAs). Exceptions are: Unit 73: conifers would be removed from the intermittent stream and outer fringe of the wetland RHCA, Units 74 and 75: conifers would be removed from the small wetland RHCA, and Unit 70: cut trees would be left in the RHCA. The purpose of these proposed treatments in RHCAs are based on the treatments contribution to promote the long-term ecological integrity of the deciduous species and associated wildlife, while having no effect on native fish (INFISH Standard and Guideline for Watershed Restoration and Habitat WR-1). Note: not all units are in all the alternatives.
	Ground-based equipment will be prohibited from entering SMZs without the appropriate variance from Montana DNRC.
	Log landings, temporary roads, and tracked line machine trails will not be located in the RHCAs. Exceptions include areas where existing log landings occur: near the mapped wetland at Unit 45 and road 62966, Unit 39 along road NFSR 5608 and Unit 23 along NFSR 62938.
	Generally, there will be no fuel storage, mixing of fuels, or refueling equipment in RHCAs. If there are no alternatives, refueling in RHCAs may occur, but must be pre-approved by the fish biologist or hydrologist and have an approved spill containment plan. Small pumps (for example, Mark III) and chainsaws can be refueled within the RHCA as long as proper spill containment actions are implemented (USDA Forest Service 1995).
	The TSA or resource specialists will monitor road conditions to ensure they do not contribute sediment to streams. Road maintenance activities (including snowplowing and dust abatement) will follow the requirements

OBJECTIVE	DESIGN FEATURE
	specified in the Programmatic Biological Assessment for Road-Related Activities (2008, & 2014) and BNF BMPs (Appendix A).
Provide stable roads and conduct road maintenance to minimize sediment.	Weed-seed-free straw bale check dams or similar treatment will be installed as needed in the inside ditch on NFSR 5621. The check dams will be installed prior to hauling, and maintained for the duration of hauling.
	Project related traffic will be regulated during wet periods to minimize erosion and sediment delivery to streams (INFISH RF-2)
	Side-casting of road material (during road maintenance and snowplowing) into streams, wetland, and RHCAs is prohibited (SMZ Rule #8; INFISH RF-2(f)).
	Seed, fertilize, and slash decompacted or recontoured roads with a native seed mix and organic fertilizer. Weed-free mulch is required on sites located within sediment contributing distance of streams (about 300 feet).
Provide for diverse and productive native and desirable non-native plant communities in riparian zones.	Protect and retain sub-merchantable trees and shrubs within 50 feet of streams and wetlands (SMZ Rule #5). If required, an application for Alternative Practice (SMZ Rule #10) would be submitted for manual thinning within the SMZ to include areas that are proposed to benefit aspen and associated species.
	Slash piles will not be created within 50 feet of streams and wetlands.
	Commercial and non-commercial aspen treatment is proposed within 100 feet of streams or wetlands in Units 70-75. The fisheries biologist or hydrologist reviewed the sites to ensure they met the riparian management objectives.
	Prescribed burning is proposed within 100 feet of streams. During development of the burn plan, the sites would be reviewed by the fisheries biologist or hydrologist to ensure they met the riparian management objectives.
	Hand ignition would be allowed within the RHCA, but not within 50 feet of streams or within wetlands (SMZ Rule #3). Fire may be allowed to back into wetlands. Helicopter ignition would not occur within RHCAs. The need for an SMZ Law Alternative Practice would also be assessed when unit-specific burn plans are developed.
	Generally, hand fireline will not be dug in the RHCAs. If needed, hand fireline can be dug in the RHCAs and must 1) avoid wetlands, 2) contain proper drainage structures, and 3) be recontoured and covered with slash upon completion of the burn. Machine fireline is prohibited in RHCAs. Allowing prescribed fire to back into RHCAs and wetlands negates the need for firelines near these areas.
Avoid direct effects to native fish and risks associated with aquatic invasive species.	If drafting from streams occurs, intake hoses will be fitted with a screen mesh equal to or smaller than 3/32 inch.
	Prior to entering the project area all equipment that has the potential to come into contact with water must be inspected, clean and dry. Do not transfer any water, sediment, or vegetation when moving between drafting sites
Ensure that water-related beneficial uses are protected and that State water quality standards are met	Protect the BRID irrigation ditches during harvest including: Lost Horse Feeder Canal and the main BRID Canal from Lake Como.
	The contract administrator will apply and monitor Best Management Practices during timber sale implementation. Applicable BMPs are in the Project File and summarized in Appendix A.
	The design and replacement of the Lick Creek culvert in road 10051 would accommodate a 100 year flood, including associated bedload and debris, and provide passage for aquatic species (INFISH RF-4 & RF-5). This is a low priority crossing for aquatic species because non-native brook trout are very

<table>
<tr><th>OBJECTIVE</th><th>DESIGN FEATURE</th></tr>
<tr><td></td><td>abundant above and below the culvert. The culvert should be replaced in context of the higher priority crossings on the Forest.</td></tr>
<tr><td colspan="2">WILDLIFE</td></tr>
<tr><td>Protect aspen clones during burning</td><td>After slashing conifers within the aspen clones, drag slash 50 feet away from the clones to prevent high fire severity within and on top of the clone. In Unit 73, 74, and northeast portion of 75 whole tree yard conifers from the aspen clone.</td></tr>
<tr><td>Provide snag habitat for wildlife</td><td>Stand level prescriptions by a certified silviculturist and wildlife biologist will provide unit-specific snag retention requirements including spatial distribution, species, and snag sizes.
Prescriptions will meet the proposed snag standards including the following number of snags over 9” DBH retained by Fire Groups if they exist in the unit prior to treatment.
<table>
<tr><td>Fire Group</td><td>Snags (average number of trees per acre)</td></tr>
<tr><td>2,4</td><td>2-5</td></tr>
<tr><td>6</td><td>4-12</td></tr>
<tr><td>7, 8, 9</td><td>10-15</td></tr>
</table>
Irregular distribution and small clumps are desirable. Snags retained will include some from the largest diameter size class available within that unit.</td></tr>
<tr><td colspan="2">THREATENED, ENDANGERED, AND SENSITIVE PLANTS</td></tr>
<tr><td>Promote revegetation with native plant species</td><td>Use local seeding guidelines for detailed procedures and appropriate mixes. Refer to the Forest Seed Mix to determine which species to use (FSM 2070.3)</td></tr>
<tr><td>Protect sensitive plant populations during harvest operations</td><td>Sensitive plant populations would be identified and buffered from project activities. Buffer widths are based on habitat requirements of the specific plant populations. Buffered sensitive plant populations will be mapped and identified in the field
Machinery, fire ignition, tree felling, anchor trees, and slash piling would not occur within an sensitive plant buffer. Fire can creep into sensitive plant sites.
Proposed alterations to locations of temp roads, TLM trails and landings will follow standard contact provisions for the protection of sensitive plants along with the timely involvement of the Forest Botanist or alternate specialist designated by the Forest Botanist. Sensitive plant populations would be protected by a minimum 100’ buffer. Use of existing roads within 100’ of population is allowed.</td></tr>
<tr><td>Promote revegetation with native plant species</td><td>Treat areas with high-risk invasive plant infestations (as defined in Regional Risk Assessment Factors and Rating protocol) before burning. Monitor treatment success after burning and retreat if necessary.
Treat invasive plants before obliterating decommissioned roads; re-vegetate after obliteration.</td></tr>
<tr><td colspan="2">INVASIVE PLANTS</td></tr>
<tr><td>Reduce the risk of invasive plant spread</td><td>Integrate invasive plant prevention and management in all prescribed burning (FSM 2080).
Remove all mud, dirt, and plant parts from off-road logging equipment before moving into the project area. Cleaning must occur off National Forest lands (this does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area).
All gravel and borrow sources would be inspected and approved, by the Forest Noxious Weed Coordinator/Forest Botanist, before use and transport. The source will not be used if invasive plants present at the pit are not found at the site of intended use. If invasive plants are present, they must be treated before transport and use.</td></tr>
</table>

OBJECTIVE	DESIGN FEATURE
	Do not operate equipment or treat areas with leafy spurge (Unit 14). These areas will be identified on a map and in the field.
HERBICIDE USE	
Protect water quality	Herbicides will not be used to control weeds within a 100-foot radius of any potable water spring development or diversion within the project area.
	Mixing and loading tanks will occur more than 300 feet from live water where possible. No mixing will occur within 100 feet of live water.(
	Use of herbicides and surfactants adhere to mitigation measures and design criteria in the Weed EIS (2003) http://www.fs.usda.gov/detail/bitterroot/landmanagement/projects
TIMBER MANAGEMENT	
Prevent the spread of annosus root disease	Apply borate to freshly cut ponderosa pine stumps greater than 12 inches in diameter (inside bark).
	Minimize damage to residual trees during harvest
Prevent pine engraver (Ips spp.) population increases	All non-commercial thinning in units with ponderosa pine and lodgepole pine must be performed between the months of July 1 thru December 31. Slash must be properly disposed of, i.e., piled and burned or lopped and scattered. Where limbs and tops exceed three inches in diameter, they need to be bucked in four-foot lengths and scattered to allow time for larger boles to dry out and not become Ips beetle host sites the following year.
RECREATION MANAGEMENT	
Protect recreation facilities	Protect all signs along roads.
Protect public safety	Place area closure signs on roads and trails during harvest and rehabilitation operations, as needed.
RANGE MANAGEMENT	
Protection of Trapper Peak grazing allotment improvements	Trapper Peak grazing allotment improvements will be mapped and protected from damage during logging operations.
HERITAGE RESOURCE MANAGEMENT	
Protect archaeological sites surrounding Lick Creek mineral lick	No ground disturbing activity in the meadow surrounding the lick or on the old logging railroad grade leading from Lick Creek to the lick.
Protect historic logging railroad grades currently in use as FS Roads.	Improvements and maintenance will be confined to existing road prism.
Protect cultural sites within the project area	No ground disturbance or pile burning to occur within 75 feet of known archaeological sites or historic structures. No excavation of historic railroad grades. Report new discoveries of cultural material to the Forest's Heritage specialists.
Protect cambium-peeled trees.	No removal of cambium-peeled ponderosa pine trees. No ground disturbance or herbicide use within the dripline of cambium-peeled trees. Employ directional falling of trees within one-and-a-half tree lengths of cambium-peeled trees. Employ hand removal of shrubs, ladder fuels and surface duff layers prior to use of underburning. Report new discoveries of cambium-peeled trees to the Forest's Heritage specialists.

The Forest Service also developed the following mitigation measures to be used in all of the action alternatives (Table 2.2- 6).

Table 2.2- 6: Mitigation Measures for the Como Forest Health Project

OBJECTIVE	MITIGATION MEASURE
WATERSHED AND FISHERIES	
Provide stable roads, conduct road maintenance and improve cross-drainage to minimize sediment and meet TMDL objectives for Lick Creek	Install new ditch drain pipe or rock-line ditch at (6) sites on NFSR 5621 and NFSR 5623. Shape road surface to facilitate drainage and apply aggregate surface to road through stream crossing and adjacent upgrade area. Clean existing ditches and pipes where needed.
SCENERY	
Subordinate management activities to the natural character of the landscape on NFSR 5621, 1111, and 429	Where feasible, minimize log landings, roads, and bladed skid trails within sensitive viewsheds (along Lake Como and Lick Cr roads); Units 8, 14, 16, 38, 45, 46, and 59
	Cut stumps to 8 inches or less that are within 125 feet of NFSR 5621 in Units 8, 14, 16, 38, and 59
	Slash piles visible from NFSR 5621, Lake Como, or campground (in Units 8, 14, 16, 38, 45, 46, and 59, would be burned within two years (or one year if feasible) of unit completion. Landing piles should be burned so that most of the debris is consumed, re-piling and re-burning as needed. Landings within sensitive viewsheds will be rehabilitated after the piles are burned by hand or machine scarification to a depth of 6-12 inches deep. Landings will be seeded in the fall, or as practicable, with native seed similar to species found in the surrounding area (check with botanist) and planted with tree seedlings.
	Within 50 feet of Trail 502 in Unit 8, remove slash, flush cut stumps to 8 inches or less, and burn slash within one year .
Reduce visual contrast	In aspen units, transition ponderosa pine density on the edges of the aspen units to avoid straight lines, right angles, or otherwise create 'unnatural' edges between the two stand types.
	Avoid straight lines and right angles in units adjacent to the forest boundary (Units 19, 26, 27, 28, 53). Vary the residual stand density to blend with adjacent forests. Treatments should follow natural topographic breaks and changes in vegetation.
	In Units 8, 14, 16, 38, 45, 46, 50, and 59 reduce the contrast between treated and untreated forest by softening the edges, retaining some understory trees, and retaining a higher density of trees on the unit borders.
	Reduce visual contrast of skyline corridors in Units 8, 15, 16, 46, and 47 to the greatest extent possible. Where feasible, avoid aligning skyline corridors so they are perpendicular to sensitive views. Vary the distances between cable corridors to minimize residual damage and reduce corridor visibility. Retain irregular clumps of leave trees.
RECREATION MANAGEMENT	
Reduce disruptions of public use in recreation sites	Log hauling may be restricted as agreed to by the District Ranger and Contracting Officer. Otherwise, log hauling will not occur on weekends or holidays The District Ranger may use flaggers during log haul operations on NFSR 5621.
Prevent motorized access through freshly logged units	Use signage, slash, downed logs, earthen humps or berms, or boulders as well as increased agency presence in the area

2.2.5.3 Project Monitoring

Monitoring is designed wherever needed to assess problems before or when they occur so corrective measures can be taken. As such, it is also a quality control/quality assurance plan. Effective implementation monitoring requires an adaptive approach to management. Monitoring, and then adapting management based on the monitoring results, is an integral feature of the action alternatives. That means when undesirable or unexpected results or conditions are identified through monitoring, the project will be assessed and changed as needed to meet the intent of the mitigation or proposed activity. This is explicitly described in some activities (i.e., if new heritage sites or sensitive plants are identified, unit boundaries or treatment types will be modified as necessary to protect the resource) but it is also implicit for the project as a whole. If or when these situations arise, project adjustments are made on the basis of the desired and predicted outcomes discussed in the Record of Decision and this EIS.

Bitterroot National Forest staff review BMP implementation and effectiveness annually. The results of this and other monitoring are summarized in the annual Forest Plan Monitoring and Evaluation Report. This report provides information about how well the management direction of the Forest is carried out, and measures the accomplishment of anticipated outputs, activities, and effects.

Project implementation monitoring is the main responsibility of the timber sale contract officer and timber sale administrator. These individuals make sure the timber sale is implemented as designed. They coordinate with resource specialists when there are potential differences between project design and field conditions or when conditions warrant resource specialist expertise.

In addition to the monitoring described in the previous paragraphs, additional monitoring is proposed by specialists to evaluate the effectiveness of old growth prescriptions, slash levels and the type of prescribed fire treatment to achieve the appropriate fire severity, areas of disturbance for invasive plant colonization, the response of OHV users in areas of timber harvest, and the development of aspen following conifer removal.

Old Growth Treatment Monitoring

Old growth characteristics in the old growth treatment units would be monitored to determine whether old growth characteristics were retained and to evaluate the effects of treatment on stand resilience to disturbances. Treated stands would be compared to non-treated stands to evaluate:

- Whether the stands continue to meet old growth characteristics as defined by Green et al. (2005)
- How long does it retain the characteristics of old growth
- Whether stand vigor changes over time
- Whether treatment reduced the potential for stand replacing fire and the length of the effect
- Whether treatment reduced stand susceptibility to bark beetles and the length of the effect
- the vegetative response to treatment and whether it followed expectations
- how treatment and non-treatment areas compare over time

The silviculturist would be responsible for developing the monitoring protocol, establishing permanent plots, supervising the collection and management of data, and periodically summarizing the results. Program funds would be used to monitor the effects of treatment on old growth.

Aspen treatment monitoring

Aspen treatments would be monitored to assess the response of aspen to conifer removal and trends of aspen density and size. Attributes of aspen clones that would be monitored are:

- changes in aspen clone density and size
- how aspen density and vigor change
- the response of vegetation to the treatment and whether it followed expectations
- comparison of treated and non-treated aspen clones

The silviculturist would be responsible for developing the monitoring protocol and supervising the data collection and management. Monitoring would occur annually for up to five years following treatment at which time data needs would be re-assessed. This monitoring project would provide information about aspen management and facilitate adapting management prescriptions to differing site conditions.

OHV user response to timber harvest

Concerns were expressed that timber harvest would incite illegal OHV use off-road. OHV tracks have been observed in the project area though the area is closed to off-road use. The recreation specialist and OHV ranger will monitor the project area for the development of new OHV trails or illegal use. New trails would be closed in ways that fit the site (Table 2.2-6)

2.3 Alternatives Considered but Eliminated from Detailed Study

NEPA requires Federal agencies to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods to achieve the purpose and need. Some of these alternatives may have been outside the project scope of reducing potential mountain pine beetle-caused ponderosa pine mortality, reducing fuel loads, and maintaining the historic fire return intervals while maintaining the visual integrity of the larger Lake Como Recreation Area. They may also have been duplicative or determined to be components of alternatives considered in detail. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

The Forest Service received 25 comments suggesting alternatives to the proposed action ((PF-Scope-044). Three comments inspired the development of Alternative 3 and four comments inspired the development of Alternative 4. Eight comments made suggestions that would be components of the alternatives and did not require a specific alternative to address them. Five comments would be similar to the No Action alternative and would be analyzed under that alternative. Their effects on mountain pine beetle-caused mortality and reducing fuel loads would be the same as the No Action alternative.

- Erect signs explaining that mountain pine beetle is a natural disturbance mechanism in ponderosa pine stands.
- Withdraw the Como Forest Health project from analysis.
- Do not close any more roads on the Bitterroot National Forest.
- Leave all trees intact. Some trees will survive and fight off beetles.
- Eliminate units that have noxious weeds present on roads within units.

Five comments suggested alternatives that were not carried through analysis. Three of these comments requested the development of an alternative that would not require any forest plan

amendments. A preliminary analysis of the project area showed that current levels of thermal cover, and old growth do not meet Forest Plan standards. Though management options exist to improve some of these conditions, they would not meet standards even after project implementation. Forest plan standards for coarse woody debris for some habitat types are higher than recommended in current research. For these reasons, this alternative was not carried through analysis.

One comment suggested the project be designed within the framework of the Montana Forest Restoration Committee 13 Principles. No specific recommendations were provided on how the project could be designed to fit the 13 Principles. ID Team review of the 13 Principles found that all the alternatives, including the No Action alternative, fit within the 13 Principles so a new alternative was not developed.

Another comment suggested the Forest Service develop an alternative that would only thin the understory and remove the diseased trees. This alternative was not carried through the analysis because the large diameter trees (trees greater than 10 inches DBH that most likely to be infested by the mountain pine beetle and cause the greatest increase in the developing population) would not be harvested. This alternative would not meet the purpose and need for the Como Forest Health project.

2.4 Comparison of Alternatives

This section provides a summary of the activities and effects of implementing each alternative. The estimates provided in the tables were derived using the same methods for each alternative and are appropriate for comparing alternatives. The numbers represent our best estimates for project implementation but actual implementation may introduce variables not anticipated that could change the final outcome. Table 2.4- 1 shows the areas of proposed activities between alternatives. A more thorough discussion of resource effects is provided in Chapter 3.

Table 2.4- 1: Proposed Activities in the Alternatives (Alt.) for the Como Forest Health Project.

ACTIVITY	ALT. 1	ALT. 2	ALT. 3	ALT. 4
PROJECT OVERVIEW				
Project Area Treated (acres)	No New Treatments	3,314	3,159	2,107
Area of prescribed fire only (acres)	0	1307	943	202
Area of timber management without prescribed fire (acres)	0	8	53	48
Area of timber management with prescribed fire (acres)	0	1999	2163	1857
TREATMENT BY FOREST TYPE (ACRES)				
Ponderosa pine	0/3,346	1,962	1,987	1,570
Lodgepole pine	0/227	189	189	0
Douglas-fir	0/1,994	1125	957	546
Aspen Release	0	0	0	39
TYPE OF TIMBER MANAGEMENT (ACRES)				
Clearcut	0	0	0	0
Commercial thin (40-80 ft^2/ac BA)	0	838	804	773
Group selection	0	288	162	0
Uneven-aged (individual tree selection)	0	342	326	342
Total Commercial Harvest (acres)	0	1,476	1,292	1,115
Non-commercial Thinning	0	531	924	745
FIRE AND FIRE MANAGEMENT				
Prescribe Fire (acres)	NA	3,306	3,106	2,059

ACTIVITY	ALT. 1	ALT. 2	ALT. 3	ALT. 4
PROJECT OVERVIEW				
Broadcast burn Low	NA	2,752	2,552	1,888
Broadcast burn Mod.	NA	542	542	171
Area treated in Wildland-Urban Interface (acres)	NA	2,236	2,059	1,509
% of treatments in the wildland-urban interface	NA	67	65	72
TYPE OF YARDING (ACRES) AND ASSOCIATED DEVELOPMENTS				
Tractor	NA	909	935	903
Skyline	NA	177	75	46
Landing piles (number)	0	193	104	93
Landing area (acres)	NA	27.4	19.3	17.4
ROADS AND ROAD MANAGEMENT				
System road construction (mile)	0	1.7	0	0.7
Temporary road development (mile)	0	1.98	0	1.1
Tracked Line-Machine Trail (mile)	0	2.6	0	0.62
Undetermined Roads to Retain (mile)	7.17	3.35	3.35	3.35
Undetermined Roads to decommission (mile)	0	3.82	3.82	3.82
Watershed Improvement (sites)	0	10	10	10
Roads stored (miles)	5.09	6.19	6.19	6.19
PROJECT FEASIBILITY				
Volume Harvested (CCF) (MBF)	0 0	11,845 5,713	10,745 5,182	9,838 4,745
Stumpage ($/CCF)	0	21.77	44.09	38.16
Is Alternative feasible	NA	yes	yes	yes
FINANCIAL EFFICIENCY				
Revenue	0	485,408	680,158	564,406
Present Net Value (PNV), Mandatory expenditures only ($)	NA	47,000	255,000	181,000
PNV, all expenditures ($)	NA	-208,578	-258,692	-268,417
ECONOMIC IMPACT				
Total jobs contributed	0	82	78	72
Total labor income ($)	0	3,809,000	3,595,000	3,307,000

Table 2.4- 2 compares the potential areas of effects between alternatives relative to the purpose and need. The interpretations of these areas of effects is in the resource sections in Chapter 3.

Table 2.4- 2: Comparison of Areas Treated by Alternative to Meet the Como Forest Health Project Purpose and Need. Interpretation of these results are discussed in Chapter 3.

MEASURE	ALT 1	ALT. 2	ALT.3	ALT.4
REDUCE POTENTIAL MOUNTAIN PINE BEETLE-CAUSE MORTALITY IN PONDEROSA PINE				
Ponderosa pine forest with basal area less than 80 ft^2/acre (area)	3,011	1,393	1,373	1,352
IMPROVE FOREST RESILIENCE TO INSECT AND DISEASE COMPLEXES, MOUNTAIN PINE BEETLE, DOUGLAS-FIR BEETLE, DWARF MISTLETOE, ROOT ROTS				
Cover Types treated (% area)	existing	treated		
Ponderosa pine	3,346 (59)	1,962 (58)	1,987 (59)	1,570 (47)
Douglas-fir	1,994 (35)	1,125 (56)	957 (48)	546 (27)
Lodgepole pine	227 (4)	189 (83)	189 (83)	0
Sub-alpine fir	55 (1)	31 (56)	30 (54)	2 (4)
aspen	21 (0.4)	0	0	39
REDUCE FUEL LOADS TO RETURN OR MAINTAIN HISTORIC FIRE RETURN INTERVALS IN THE PROJECT AREA AS				

MEASURE	ALT 1	ALT. 2	ALT.3	ALT.4
MEASURED BY POTENTIAL FIRE SEVERITY				
Area by Fire Type (acres)				
Surface fire	1,729	3,611	2,914	2,828
Torching fire	3,420	1,921	2,467	2,406
Crown Fire	497	165	315	462
MAINTAIN THE VISUAL INTEGRITY OF THE LARGER LAKE COMO RECREATION AREA				
Commercial harvest units visible from viewsheds with retention VQO (unit #)	none	8, 9, 15, 16, 45, 46, 47	Part 9, 45, 47	none
Area that meets visual quality objectives	All viewpoints meet VQOs at this time	Lake Como, Lake Como Recreation area, Lake Como Road do not meet VQOs	Lake Como, Lake Como Recreation area, Lake Como Road do not meet VQOs	All viewpoints meet VQOs

Table 2.4- 3 compares the areas of effects between alternatives relative to the issue indicators described in Chapter 1 where effects can be distinguished quantitatively. A qualitative comparison for those effects that cannot be displayed quantitatively is provided after the table. Interpretations of these effects are provided in Chapter 3.

Table 2.4- 3: Comparison of Issue Indicators described in Chapter 1.

ISSUE INDICATOR	ALT. 1	ALT. 2	ALT.3	ALT.4
ROAD CONSTRUCTION				
Miles of new Forest System roads	0	1.7	0	0.7
Miles of temporary roads	0	2.0	0	1.1
Miles of Tracked Line-Machine trails	0	2.6	0	0.5
TRANSPORTATION SYSTEM AND MANAGEMENT				
miles of open roads	18.31	18.73	18.73	18.73
miles of closed roads	18.06	20.99	20.99	20.99
Total miles of road	42.9	39.08	39.08	39.08
Miles of roads decommissioned	0	3.82	3.82	3.82
SUSTAIN WILDLIFE HABITAT NEEDS				
Area more than ½ mile from roads	1,097	848	854	1,022
Area of thermal cover after treatment	869	273	424	806
% thermal cover in winter range	15	4.7	7.4	14
Area of hiding cover after treatment (acres)	3,077	1,222	1,482	2,314
Elk Habitat Effectiveness (EHE) >25% roaded 3rd order watershed: 50% EHE <25% roaded watershed: 60%	2 watersheds:<50% 1 watersheds:>50% 2 watersheds:>60%	No change from Alternative 1	No change from Alternative 1	No change from Alternative 1
SENSITIVE SPECIES				
Suitable flammulated owl habitat not treated (acre)	3,009	1,297	1,245	1,795
Fisher resting/denning/foraging treated (acre)	NA	1,386	1,218	831
Fisher total undisturbed habitat (acre)	2196	810	978	1,365

ISSUE INDICATOR	ALT. 1	ALT. 2	ALT.3	ALT.4
THREATENED OR ENDANGERED SPECIES				
Area of Canada lynx habitat (3 acre)	All lynx standards and guidelines met	Veg. S6 and G4 not met	Veg. S6 and G4 not met	All lynx standards and guidelines met
OLD GROWTH FOREST				
% of old growth by Management area in each 3rd order watershed	Meets Forest Plan standard in 2 of 16 MA-3rd order watershed combinations: MA 2	Does not meet Forest Plan standards in any MA-3rd order watershed combination	Does not meet Forest Plan standards in any MA-3rd order watershed combination	Meets Forest Plan standard in 2 of 16 MA-3rd order watershed combinations: MA 2
Area of treated old growth (acres)	0/345	183	143	0
Not treated suitable pileated woodpecker habitat (acre) (old growth MIS)	3,200	1,438	1,403	1,972
Not treated Suitable American marten habitat (acre) (old growth MIS)	1,081	486	587	1,032
Female marten carrying capacity	6	2	2	6
VISUAL QUALITY				
Project area that does not meet retention VQO (acres)	0/807	114	32	0
Project area that does not meet partial retention VQO (acres)	0/1,469	0	0	0

2.4.1.1 Comparison of Qualitative Effects

Wildlife

Alternative 1 would have no effect on black-backed woodpecker, long-eared myotis, long legged myotis, western big-eared bat, gray wolf, western toad, and wolverine. Alternatives 2, 3, and 4 may affect but are not likely to trend to Federal listing black-backed woodpecker, long-eared myotis, long legged myotis, western big-eared bat, western toad, and wolverine. These alternatives would have no effect of gray wolf.

Recreation

There would be no changes on forest visitor use or travel in the Alternative 1. Dispersed campsites may be closed during timber sale operations and displace campers in Alternatives 2, 3, and 4. Travelers may experience travel delays or temporary road closures due to timber sale operations in Alternatives 2, 3, and 4.

Fisheries

Alternative 1 would have no effect on bull trout, bull trout critical habitat, westslope cutthroat trout, and western pearlshell mussel. Alternatives 2, 3, and 4 may affect but are not likely to trend to Federal listing bull trout, bull trout critical habitat, westslope cutthroat trout. Western pearlshell mussel would not be affected by activities in Alternatives 2, 3, and 4.

Hydrology

In all alternatives there is very low potential of sedimentation. Wetlands would not be affected under Alternative 1. Project design features would keep potential effects on wetlands at low, though aspen treatments may slightly increase wetland effects.

Weeds

No change in potential weed spread would be expected under Alternative 1. Alternative 2 would have the highest potential for weed spread of the alternatives because of the amount of road construction and associated soil disturbance. This effect would be reduced through the application of design features and BMPs. The potential for weed spread under Alternatives 3 and 4 would be between that of Alternatives 1 and 2 because of there are no roads constructed in Alternative 3 and fewer roads constructed under Alternative 4 than Alternative 2. Again, design features would reduce and rehabilitate the soil disturbance created by road construction and use.

Wild and Scenic River Eligibility

None of the alternatives would affect the Wild and Scenic River eligibility of Lost Horse Creek and Canyon.

Roadless Expanse

Alternative 1 would have no effects on roadless expanse attributes of natural integrity, apparent naturalness, solitude and primitive recreation, remoteness, unique features, or manageability or boundaries. Alternatives 2, 3, and 4 would have no effect on natural integrity or manageability or boundaries. There are no unique features in the roadless expanse within the effects area of Como Forest Health project area. The attributes of apparent naturalness, solitude and primitive recreation, and remoteness would be lower during project implementation and until roads were rehabilitated.